

#13

03/01/04 16:57 FAX 2155685789

DB&R PHILA.

001



DRINKER BIDDLE & REATH LLP  
ONE LOGAN SQUARE  
18<sup>TH</sup> and Cherry Streets  
PHILADELPHIA, PA  
USA 19103-6996

Telephone: (215) 988-2700  
FACSIMILE NUMBER: (215) 988-2757

DATE: March 1, 2004

FAX NO.: 703) 305-3230

TO: ATTN: INDIA L. EVANS

FROM: Karen M. Spina --Legal Assistant for  
Daniel A. Monaco, Esq. -- Tel.: (215) 988-3312 (Reg. No. 30,480)  
Customer No. 23973

RE: US Application No. 09/831,686  
Attorney Docket: 37921-151956 (43232-1)

PAGES: 34

COMMENTS: Dear India -- As we discussed today, please find attached in connection with the above-identified application:  
Copies of (1) FORM PCT/DO/EO/918 mailed 02/23/04;  
(2) Notification of Defective Response; (3) complete Response to Formalities Letter as mailed to the USPTO on February 18, 2004;  
(4) Express Mail Label No. EL998872976US; and (5) postcard receipt (date-stamped postcard not yet received in our offices).

THANK YOU FOR YOUR ASSISTANCE

ORIGINAL:

The information contained in this facsimile message is attorney privileged and confidential information intended only for the use of the individual or entity named above. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and return the original message to us at the above address by mail. Thank you.

*If there are any problems with this transmission,  
please call 215-988-2700 immediately.*

PHIP\361994\1

Best Available Copy



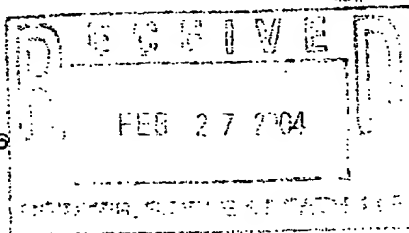
## UNITED STATES PATENT AND TRADEMARK OFFICE

167321

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

U.S. APPLICATION NUMBER NO. 09/831,686	FIRST NAMED APPLICANT Stephen Alister Locammi	ATTY. DOCKET NO. 37921151956
-------------------------------------------	--------------------------------------------------	---------------------------------

23973  
DRINKER BIDDLE & REATH  
ONE LOGAN SQUARE  
18TH AND CHERRY STREETS  
PHILADELPHIA, PA 19103-6996



INTERNATIONAL APPLICATION NO. PCT/AU99/00993
-------------------------------------------------

1A. FILING DATE 11/10/1999	PRIORITY DATE 11/11/1998
-------------------------------	-----------------------------

CONFIRMATION NO. 7052  
371 FORMALITIES LETTER



\*OC000000011952929\*

Date Mailed: 02/23/2004

## NOTIFICATION OF DEFECTIVE RESPONSE ABANDONMENT

The United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.435) has made the following determination:

Applicant has failed to properly respond to the notification of MISSING REQUIREMENTS (Form PCT/DO/EO/905), mailed 06/13/2001 within the time period set therein.

Therefore, the above identified application failed to meet the requirements of 35 U.S.C. 371 and 37 CFR 1.495, and is ABANDONED AS TO THE UNITED STATES OF AMERICA.

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

A copy of this notice **MUST** be returned with the response.

INDIA L EVANS

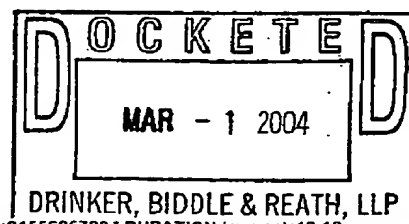
Telephone: (703) 305-2936

## PART 2 - OFFICE COPY

U.S. APPLICATION NUMBER NO. 09/831,686	INTERNATIONAL APPLICATION NO. PCT/AU99/00993	ATTY. DOCKET NO. 37921151956
-------------------------------------------	-------------------------------------------------	---------------------------------

FORM PCT/DO/EO/918 (371 Formalities Notice)

COPY





## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
09/831,686	Stephen Alistar Locamini	37921151956
INTERNATIONAL APPLICATION NO.		
PCT/AU99/00993		
1A. FILING DATE	PRIORITY DATE	
11/10/1999	11/11/1998	

23973  
DRINKER BIDDLE & REATH  
ONE LOGAN SQUARE  
18TH AND CHERRY STREETS  
PHILADELPHIA, PA 19103-6996

CONFIRMATION NO. 7052

371 FORMALITIES LETTER



"OC000000010828228"

Date Mailed: 09/08/2003

## NOTIFICATION OF DEFECTIVE RESPONSE

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- Indication of Small Entity Status
- Priority Document
- Original Specification filed on 07/31/2001
- Drawings filed on 07/31/2001
- Claims filed on 07/31/2001
- Oath or Declaration filed on 07/31/2001
- Initial Application Filing Fees filed on 07/31/2001
- Small Entity Statement filed on 07/31/2001
- Copy of the International Application filed on 05/10/2001
- Copy of the International Search Report filed on 05/10/2001
- Copy of IPE Report filed on 05/10/2001
- Preliminary Amendments filed on 05/10/2001
- Information Disclosure Statements filed on 04/23/2002
- Biochemical Sequence Diskette filed on 07/31/2001
- Oath or Declaration filed on 07/31/2001
- Biochemical Sequence Listing filed on 07/31/2001
- Request for Immediate Examination filed on 05/10/2001
- U.S. Basic National Fees filed on 05/10/2001
- Power of Attorney filed on 07/31/2001

COPY

Applicant's response filed 04/23/2002 is hereby acknowledged. The following requirements set forth in the NOTIFICATION of MISSING REQUIREMENTS mailed 06/13/2001 have not been completed.

Applicant is required to complete the response within a time limit of ONE MONTH from the date of this Notification or within the time remaining in the response set forth in the Notification of Missing Requirements, whichever is the longer. No extension of this time limit may be granted under 37 CFR 1.136, but the period for response set in the Notification of Missing Requirements may be extended under 37 CFR 1.136(a).

The following items **MUST** be furnished within the period set forth below:

- The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 CFR 1.821-1.825 for the following reason(s):
  - The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A substitute computer readable form must be submitted as required by 37 CFR 1.825(d).
  - APPLICANT MUST PROVIDE:
    - An initial or substitute computer readable form (CRF) of the "Sequence Listing."
- For questions regarding compliance to 37 CFR 1.821-1.825 requirements, please contact:
  - For Rules Interpretation, call (703) 308-4216
  - To Purchase PatentIn Software, call (703) 306-2600
  - For PatentIn Software Program Help, call (703) 306-4119 or e-mail at [patin21help@uspto.gov](mailto:patin21help@uspto.gov) or [patin3help@uspto.gov](mailto:patin3help@uspto.gov)

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

INDIA L EVANS

Telephone: (703) 305-2936

PART 1 - ATTORNEY/APPLICANT COPY

U.S. APPLICATION NUMBER NO.	INTERNATIONAL APPLICATION NO.	ATTY. DOCKET NO.
09/831,686	PCT/AU99/00993	37921151956

FORM PCT/DO/EO/916 (371 Formalities Notice)

COPY



COPY

Attorney Docket No. 43232-1  
 Re: Patent Application of LOCARNINI et al.  
 Appl. No.: 09/831,888  
 I.A. PCT/AU99/00993 filed November 10, 1999  
 For: BIOLOGICAL COMPOSITIONS, COMPONENTS THEREOF AND  
 USES THEREFOR  
 The U.S. Patent Office acknowledges and has stamped hereon the date of receipt of  
 the attached paper(s):

(1) PTO/SB/64/PCT (substitute) PETITION FOR REVIVAL OF AN INTERNATIONAL  
 APPLICATION FOR PATENT DESIGNATING THE U.S. ABANDONED  
 UNINTENTIONALLY UNDER 37 CFR 1.137(B)  
 (2) Response to 371 NOTIFICATION OF DEFECTIVE RESPONSE  
 (3) Sequence Listing Diskette; (4) Paper Copy of Sequence Listing  
 (5) Check for Petition fee \$650

Certificate of Express Mailing 1:10: February 18, 2004

Express Mail Label No.:  
**EL998872976US**  
 (37921-151956)



1025130 1026004802 3485588

COPY

PTO/SE/84/PCT (06-03)

Approved for use 12/31/2003. OMB 0851-0021

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1996, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**PETITION FOR REVIVAL OF AN INTERNATIONAL APPLICATION FOR PATENT  
DESIGNATING THE U.S. ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(b)**Docket Number  
(Optional)  
43232-1

First Named Inventor: Stephen Alister LOCARNINI et al.

International (PCT) Application No.: PCT/AU99/00993

U.S. Application No.: 09/831,686  
(if known)

Filed: November 10, 1999

Title: BIOLOGICAL COMPOSITIONS, COMPONENTS THEREOF AND USES THEREFOR

Attention: PCT Legal Staff  
Mail Stop PCT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

The above-identified application became abandoned as to the United States for failure to reply to the NOTIFICATION OF DEFECTIVE RESPONSE mailed on September 8, 2003. The date of abandonment is October 9, 2003 (the day after the date on which the response to the Notification was due).

**APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION**

NOTE: A grantable petition requires the following items:

- (1) Petition fee
- (2) Proper reply
- (3) Terminal disclaimer with disclaimer fee which is required for all international applications having an international filing date before June 8, 1995; and
- (4) Statement that the entire delay was unintentional.

**1. Petition fee**☒ Small entity - fee \$ 650 (37 CFR 1.17(m)). Applicant claims small entity status.  
See 37 CFR 1.27.☐ Other than small entity - fee \$ \_\_\_\_\_ (37 CFR 1.17(m))**2. Proper reply**A. The proper reply (the missing 35 U.S.C. 371(c) requirement(s)) in the form of response to  
Notification of Defective Response (Identify type of reply):  
include substitute Computer Readable Form of Sequence Listing (37 CFR 1.825(d))☐ has been filed previously on \_\_\_\_\_☒ is enclosed herewith.

(Page 1 of 2)

This collection of information is required by 37 CFR 1.137(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-5199 and select option 2.

COPY

PTO/SB/64/PCT (08-03)

Approved for use through 12/31/2003. OMB 0651-0021

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

## 3. Terminal disclaimer with disclaimer fee

- ☒ Since this international application has an international filing date on or after June 8, 1995, no terminal disclaimer is required.
- ☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ \_\_\_\_\_ for a small entity or \$ \_\_\_\_\_ for other than a small entity) disclaiming the required period of time is enclosed herewith (see PTO/SB/83).

4. Statement. The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

February 18, 2004

Date

(215) 988-3312

Telephone Number

30,480

Registration Number, if applicable

Signature

DANIEL A. MONACO

Typed or Printed Name

DRINKER BIDDLE &amp; REATH LLP

One Logan Square, 18th and Cherry Streets

Address

Philadelphia, PA 19103-6996

Address

- Enclosures: ☒ Response to Notification of Defective Response including substitute computer readable format of sequence listing and paper copy
- ☒ Fee Payment
- ☐ Terminal Disclaimer
- ☒ Postcard receipt



COPY PATENT

Atty. Docket No.: 43232-1

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Patent application of  
Stephen Alister LOCARNINI *et al.*

International Application No.  
PCT/AU99/00993

Int'l Filing Date:  
November 10, 1999

For: BIOLOGICAL COMPOSITIONS,  
COMPONENTS THEREOF AND USES  
THEREFOR

U.S. Application No.  
09/831,686


Confirmation No. 7052

ATTN: PCT Legal Staff  
Mail Stop PCT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Response to Notice of Defective Response

Sir:

Submitted herewith is a response to the NOTIFICATION OF DEFECTIVE RESPONSE mailed on September 8, 2003. A copy of the Notification is submitted herewith. This response is being submitted with a PETITION FOR REVIVAL OF AN INTERNATIONAL APPLICATION FOR PATENT DESIGNATING THE U.S. ABANDONED UNINTENTIONALLY UNDER 37 C.F.R. § 1.137(b).

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.10	
EXPRESS MAIL Mailing Label Number:	EL 998672976 US
Date of Deposit:	February 17, 2004
I hereby certify that this correspondence, along with any paper referred to as being attached or enclosed, and/or fee, is being deposited with the United States Postal Service, "EXPRESS MAIL-POST OFFICE TO ADDRESSEE" service under 37 C.F.R. 1.10, on the date indicated above, and addressed to: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450	
Signature of person mailing page: 	
KAREN M. SPINA Type or print name of person	

U.S. Application No. 09/831,686

Attorney Docket No. 43232-1

**REMARKS**

Please note the change in attorney docket number (it is now 43232-1).

The Notification of Defective Response indicated that the computer readable form of the sequence listing submitted on April 23, 2002 contained errors, which were detailed in the attached CRF Diskette Problem Report. The Applicants enclose a substitute computer readable form of the sequence listing, in which these errors have been corrected.

A substitute paper copy of the sequence listing, which is identical to the computer readable form of the sequence listing, is also provided. Please amend the present application by replacing the existing paper copy of the sequence listing with the paper copy of the sequence listing submitted herewith.

The errors identified in the CRF Diskette Problem Report were corrected as follows. No new matter was introduced by these corrections.

Field <213> for SEQ ID NOS: 1-4 was changed to read "Artificial sequence," per 37 C.F.R. 1.823, and field <223> for SEQ ID NOS: 1-4 was changed to indicate that the sequences are synthetic.

The feature description for amino acid 25 in SEQ ID NO: 1 previously identified amino acid 25 as "Xaa = L or R." However, both SEQ ID NO: 1 and Formula I on pgs. 8-11 of the specification (which corresponds to SEQ ID NO: 1) indicate that amino acid 25 in SEQ ID NO: 1 is an isoleucine. The feature description for amino acid 26 of SEQ ID NO: 1 incorrectly indicated that "Xaa = T or K," and failed to include a feature description for amino acid 27 (which is also an "Xaa"). Formula I shows that amino acid 26 of SEQ ID NO: 1 is leucine (L) or arginine (R), and that amino acid 27 of SEQ ID NO: 1 is threonine (T) or lysine (K). The feature descriptions were therefore changed to indicate that amino acid 26 is "Xaa = L or R," and that amino acid 27 is "Xaa = T or K," and to delete the feature description for amino acid 25. No new matter has been introduced by these changes.

The feature description for amino acid 2 in SEQ ID NO: 2 indicated that "Xaa = N or D." As pointed out by the Examiner, an amino acid which can be either asparagine (N) or aspartic acid (D) should be indicated by "Asx" in the actual sequence. SEQ ID NO: 2 has therefore been amended to replace the "Xaa" at position 2 with "Asx," and the feature description for this amino acid has been eliminated as unnecessary. No new matter has been introduced by this change.

PHIP369647\1

- 2 -

U.S. Application No. 09/831,686

orney Docket No. 43232-1.

"Glx" instead of "Xaa" was also inadvertently used SEQ ID NO: 2 to indicate variant amino acids, except for amino acid 141 (which can be either glutamine or glutamic acid) and was thus correctly identified as "Glx". The feature descriptions for SEQ ID NO: 2, as well as Formula II on pgs. 14-17 of the specification (which corresponds to SEQ ID NO: 2), show that none of the variant amino acids except amino acid 141 are Glx. All occurrences of "Glx" in SEQ ID NO: 2, except for amino acid 141, were therefore changed to "Xaa." No new matter has been introduced by these changes.

The feature descriptions of SEQ ID NO: 2 also used the symbol "Z" instead of "Xaa" in reference to the variant amino acids in the sequence. Each symbol "Z" in the feature descriptions of SEQ ID NO: 2 was therefore replaced with "Xaa." No new matter has been added by these changes.

The feature description for amino acid 130 of SEQ ID NO: 2, which indicated that "M = amino acid 550," has been deleted.

Amino acid 150 of SEQ ID NO: 2 is "Xaa," but no feature description for this amino acid was included in the sequence listing. Formula II indicates that amino acid 150 in SEQ ID NO: 2 is either valine or isoleucine. A feature description for amino acid 150 which reads "Xaa = V or I" was therefore added. No new matter has been introduced by this change.

The feature descriptions for SEQ ID NO: 3, which is a synthetic DNA sequence, defined numerous variant nucleotides and indicated that each variant nucleotide could be one of two specific bases. (For example, the nucleotide at position 3 can be A or C.) The symbol "n" was used in SEQ ID NO: 3 to indicate the variant nucleotides. However, the one-letter codes set forth in the PCT Administrative Instructions, Annex C, Appendix 2, Table 1 should be used for variant nucleotides which can be one of two different, but defined, bases. 37 C.F.R. 1.822(b). SEQ ID NO: 3 has been amended to replace each "n" in the sequence with the appropriate one-letter code, and the feature descriptions for this sequence have been deleted as unnecessary. No new matter has been added by these changes.

Field <221> in the feature descriptions for SEQ ID NO: 4 used the term "misc" to describe the features. The Examiner suggested using "misc\_feature" in this field; however, "misc\_feature" should only be used in reference to nucleic acid sequences, and SEQ ID NO: 4 is a protein. Therefore, each field <221> in the feature descriptions for SEQ ID NO: 4 was changed from "misc" to "variant." No new matter has been added by these changes.

U.S. Application No. 09/831,686

orney Docket No. 43232-1

The originally-filed SEQ ID NO: 4 had incorrectly listed the variant amino acids by placing each alternative amino acid into the sequence itself, rather than indicating each variant by "Xaa" and defining the variants in the feature descriptions. Also, many of the arginines in the sequence were inadvertently listed as "Xaa," and defined as "X = N" in the feature descriptions (wherein "N" was meant to indicate arginine). Page 6, lns. 6-14 and page 30, lns. 14 of the present specification indicate that the consensus amino acid of SEQ ID NO: 4 is set forth in Fig. 2. See also the "Amendment and Statement under 37 C.F.R. 1.821(f)(g)" filed on April 9, 2003. To correct the errors appearing in SEQ ID NO: 4 as originally filed, SEQ ID NO: 4 has been replaced by a properly-formatted amino acid sequence corresponding to the consensus sequence of Fig. 2. No new matter has been added by this amendment.

Finally, Field <213> for each of SEQ ID NOS: 5-16 used the term "HBV" to indicate that these sequences originated from hepatitis B virus. The term "HBV" in each field <213> for SEQ ID NOS: 5-16 has been replaced by the proper scientific name (genus and species), for hepatitis B virus; i.e., *Orthohepadnavirus hepatitis B*. No new matter has been added by these changes.

**Statement Under 37 C.F.R. 1.825(b)**

The undersigned hereby states that the substitute paper copy of the sequence listing submitted herewith is identical to the computer readable form of the sequence listing, which is also submitted herewith.

Respectfully submitted

STEPHEN ALISTER LOCARNINI *et al.*

BY 

DANIEL A. MONACO

Reg. No. 30,480

DRINKER, BIDDLE & REATH, LLP.

One Logan Square

18<sup>th</sup> and Cherry Streets

Philadelphia, PA 19103-6996

(215) 988-3312 - ph.

(215) 988-2757 - fax

Attorney for Applicants

PHIP369647\1

- 4 -

43232-1.TXT

## SEQUENCE LISTING

COPY

<110> Stephen Alister Locarnini  
Joseph Torresi  
Linda Earnest-Silvera  
Angela Ingrid Bartholomeusz

<120> Biological Compositions, Components  
Thereof and Uses Therefor

<130> 43232-1

<140> 09/831,686

<141> - -

<150> PCT/AU99/00993

<151> 1999-11-10

<150> AU PP7060

<151> 1998-11-11

<160> 16

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 226

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<220>

<221> variant

<222> (2)..(2)

<223> xaa = E or G or D

<220>

<221> variant

<222> (3)..(3)

<223> xaa = N or S or K

<220>

<221> variant

<222> (4)..(4)

<223> xaa = I or T

<220>

<221> variant

<222> (5)..(5)

<223> xaa = T or A

<220>

<221> variant

<222> (8)..(8)

<223> xaa = F or L

<220>

<221> variant

<222> (10)..(10)

43232-1.TXT

&lt;223&gt; Xaa = G or R

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (13)..(13)

&lt;223&gt; Xaa = L or R

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (18)..(18)

&lt;223&gt; Xaa = G or V

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (19)..(19)

&lt;223&gt; Xaa = F or C

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (21)..(21)

&lt;223&gt; Xaa = L or S or W

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (24)..(24)

&lt;223&gt; Xaa = R or K

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (26)..(26)

&lt;223&gt; Xaa = L or R

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (27)..(27)

&lt;223&gt; Xaa = T or K

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (30)..(30)

&lt;223&gt; Xaa = Q or K

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (33)..(33)

&lt;223&gt; Xaa = D or H

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (44)..(44)

&lt;223&gt; Xaa = G or E or A

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (45)..(45)

&lt;223&gt; Xaa = S or A or V or T or L

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (46)..(46)

&lt;223&gt; Xaa = P or T

&lt;220&gt;

Page 2

43232-1.TXT

<221> variant  
<222> (47)..(47)  
<223> Xaa = V or R or T or K or G

<220>  
<221> variant  
<222> (49)..(49)  
<223> Xaa = L or P

<220>  
<221> variant  
<222> (51)..(51)  
<223> Xaa = Q or L or K

<220>  
<221> variant  
<222> (53)..(53)  
<223> Xaa = S or L

<220>  
<221> variant  
<222> (56)..(56)  
<223> Xaa = P or Q

<220>  
<221> variant  
<222> (57)..(57)  
<223> Xaa = T or I

<220>  
<221> variant  
<222> (59)..(59)  
<223> Xaa = N or S

<220>  
<221> variant  
<222> (61)..(61)  
<223> Xaa = S or L

<220>  
<221> variant  
<222> (63)..(63)  
<223> Xaa = T or I

<220>  
<221> variant  
<222> (64)..(64)  
<223> Xaa = S or C

<220>  
<221> variant  
<222> (68)..(68)  
<223> Xaa = I or T

<220>  
<221> variant  
<222> (70)..(70)  
<223> Xaa = P or A

<220>  
<221> variant  
<222> (78)..(78)  
<223> Xaa = R or Q

Page 3

43232-1.TXT

<220>  
<221> variant  
<222> (85)..(85)  
<223> Xaa = F or C

<220>  
<221> variant  
<222> (100)..(100)  
<223> Xaa = Y or C

<220>  
<221> variant  
<222> (105)..(105)  
<223> Xaa = P or H or S

<220>  
<221> variant  
<222> (110)..(110)  
<223> Xaa = I or L

<220>  
<221> variant  
<222> (112)..(112)  
<223> Xaa = G or R

<220>  
<221> variant  
<222> (113)..(113)  
<223> Xaa = S or T

<220>  
<221> variant  
<222> (114)..(114)  
<223> Xaa = T or S

<220>  
<221> variant  
<222> (118)..(118)  
<223> Xaa = T or V or A

<220>  
<221> variant  
<222> (119)..(119)  
<223> Xaa = G or E or Q

<220>  
<221> variant  
<222> (120)..(120)  
<223> Xaa = P or A or S

<220>  
<221> variant  
<222> (122)..(122)  
<223> Xaa = K or R

<220>  
<221> variant  
<222> (125)..(125)  
<223> Xaa = T or M

<220>  
<221> variant

Page 4



43232-1.TXT

<222> (126)..(126)  
<223> Xaa = T or I or S or A

<220>  
<221> variant  
<222> (127)..(127)  
<223> Xaa = P or T or A or I or L

<220>  
<221> variant  
<222> (128)..(128)  
<223> Xaa = A or V

<220>  
<221> variant  
<222> (131)..(131)  
<223> Xaa = N or T

<220>  
<221> variant  
<222> (133)..(133)  
<223> Xaa = M or K or L

<220>  
<221> variant  
<222> (134)..(134)  
<223> Xaa = F or Y or I

<220>  
<221> variant  
<222> (136)..(136)  
<223> Xaa = S or Y

<220>  
<221> variant  
<222> (137)..(137)  
<223> Xaa = C or S

<220>  
<221> variant  
<222> (140)..(140)  
<223> Xaa = T or I or S

<220>  
<221> variant  
<222> (143)..(143)  
<223> Xaa = T or S

<220>  
<221> variant  
<222> (144)..(144)  
<223> Xaa = D or A

<220>  
<221> variant  
<222> (155)..(155)  
<223> Xaa = S or T

<220>  
<221> variant  
<222> (158)..(158)  
<223> Xaa = F or L

## 43232-1.TXT

<220>  
<221> variant  
<222> (159)..(159)  
<223> Xaa = A or G or V

<220>  
<221> variant  
<222> (160)..(160)  
<223> Xaa = K or R or T

<220>  
<221> variant  
<222> (161)..(161)  
<223> Xaa = Y or F

<220>  
<221> variant  
<222> (165)..(165)  
<223> Xaa = W or G

<220>  
<221> variant  
<222> (166)..(166)  
<223> Xaa = A or G

<220>  
<221> variant  
<222> (168)..(168)  
<223> Xaa = V or A

<220>  
<221> variant  
<222> (170)..(170)  
<223> Xaa = F or L

<220>  
<221> variant  
<222> (174)..(174)  
<223> Xaa = S or N

<220>  
<221> variant  
<222> (177)..(177)  
<223> Xaa = V or A

<220>  
<221> variant  
<222> (178)..(178)  
<223> Xaa = P or Q

<220>  
<221> variant  
<222> (182)..(182)  
<223> Xaa = W or C or S

<220>  
<221> variant  
<222> (183)..(183)  
<223> Xaa = F or C

<220>  
<221> variant  
<222> (184)..(184)

43232-1.TXT

&lt;223&gt; xaa = V or D or A

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (185)..(185)

&lt;223&gt; xaa = G or E

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (187)..(187)

&lt;223&gt; xaa = S or F

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (189)..(189)

&lt;223&gt; xaa = T or I

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (192)..(192)

&lt;223&gt; xaa = L or P

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (193)..(193)

&lt;223&gt; xaa = S or L

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (194)..(194)

&lt;223&gt; xaa = A or V

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (197)..(197)

&lt;223&gt; xaa = M or I

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (198)..(198)

&lt;223&gt; xaa = M or I

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (200)..(200)

&lt;223&gt; xaa = Y or F

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (202)..(202)

&lt;223&gt; xaa = G or E

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (204)..(204)

&lt;223&gt; xaa = S or N or K

&lt;220&gt;

&lt;221&gt; variant

&lt;222&gt; (205)..(205)

&lt;223&gt; xaa = L or Q

&lt;220&gt;

Page 7

## 43232-1.TXT

<221> variant  
 <222> (206)..(206)  
 <223> Xaa = Y or F or H or C

<220>  
 <221> variant  
 <222> (207)..(207)  
 <223> Xaa = S or G or N or D or T

<220>  
 <221> variant  
 <222> (209)..(209)  
 <223> Xaa = V or L

<220>  
 <221> variant  
 <222> (210)..(210)  
 <223> Xaa = S or N

<220>  
 <221> variant  
 <222> (213)..(213)  
 <223> Xaa = I or M or L

<220>  
 <221> variant  
 <222> (220)..(220)  
 <223> Xaa = F or C

<220>  
 <221> variant  
 <222> (221)..(221)  
 <223> Xaa = C or Y

<220>  
 <221> variant  
 <222> (223)..(223)  
 <223> Xaa = W or R

<220>  
 <221> variant  
 <222> (224)..(224)  
 <223> Xaa = V or A

<220>  
 <221> variant  
 <222> (225)..(225)  
 <223> Xaa = Y or I or S

<400> 1  
 Met Xaa Xaa Xaa Xaa Ser Gly Xaa Leu Xaa Pro Leu Xaa Val Leu Gln  
 1 5 10 15  
 Ala Xaa Xaa Phe Xaa Leu Thr Xaa Ile Xaa Xaa Ile Pro Xaa Ser Leu  
 20 25 30  
 Xaa Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Xaa Xaa Xaa Cys  
 35 40 45  
 Xaa Gly Xaa Asn Xaa Gln Ser Xaa Xaa Ser Xaa His Xaa Pro Xaa Xaa  
 50 55 60  
 Cys Pro Pro Xaa Cys Xaa Gly Tyr Arg Trp Met Cys Leu Xaa Arg Phe  
 65 70 75 80  
 Ile Ile Phe Leu Xaa Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val  
 85 90 95  
 Leu Leu Asp Xaa Gln Gly Met Leu Xaa Val Cys Pro Leu Xaa Pro Xaa  
 Page 8

## 43232-1.TXT

```

      100      105      110
Xaa Xaa Thr Thr Ser Xaa Xaa Xaa Cys Xaa Thr Cys Xaa Xaa Xaa Xaa
      115      120      125
Gln Gly Xaa Ser Xaa Xaa Pro Xaa Xaa Cys Cys Xaa Lys Pro Xaa Xaa
      130      135      140
Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Xaa Trp Ala Xaa Xaa Xaa
      145      150      155      160
Xaa Leu Trp Glu Xaa Xaa Ser Xaa Arg Xaa Ser Trp Leu Xaa Leu Leu
      165      170      175
Xaa Xaa Phe Val Gln Xaa Xaa Xaa Xaa Leu Xaa Pro Xaa Val Trp Xaa
      180      185      190
Xaa Xaa Ile Trp Xaa Xaa Trp Xaa Trp Xaa Pro Xaa Xaa Xaa Ile
      195      200      205
Xaa Xaa Pro Phe Xaa Pro Leu Leu Pro Ile Phe Xaa Xaa Leu Xaa Xaa
      210      215      220
Xaa Ile
      225

```

<210> 2  
 <211> 181  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<220>  
 <221> variant  
 <222> (17)..(17)  
 <223> Xaa = I or P

<220>  
 <221> variant  
 <222> (29)..(29)  
 <223> Xaa = I or V

<220>  
 <221> variant  
 <222> (35)..(35)  
 <223> Xaa = S or D

<220>  
 <221> variant  
 <222> (44)..(44)  
 <223> Xaa = T or N

<220>  
 <221> variant  
 <222> (46)..(46)  
 <223> Xaa = R or N

<220>  
 <221> variant  
 <222> (47)..(47)  
 <223> Xaa = N or I

<220>  
 <221> variant  
 <222> (48)..(48)  
 <223> Xaa = any amino acid

<220>

## 43232-1.TXT

<221> variant  
<222> (50)..(50)  
<223> Xaa = N or Y or H

<220>  
<221> variant  
<222> (52)..(52)  
<223> Xaa = H or Y

<220>  
<221> variant  
<222> (53)..(53)  
<223> Xaa = G or R

<220>  
<221> variant  
<222> (54)..(56)  
<223> Xaa = any amino acid

<220>  
<221> variant  
<222> (57)..(57)  
<223> Xaa = D or N

<220>  
<221> variant  
<222> (60)..(60)  
<223> Xaa = D or N

<220>  
<221> variant  
<222> (61)..(61)  
<223> Xaa = S or Y

<220>  
<221> variant  
<222> (65)..(65)  
<223> Xaa = N or Q

<220>  
<221> variant  
<222> (71)..(71)  
<223> Xaa = L or M

<220>  
<221> variant  
<222> (75)..(75)  
<223> Xaa = K or Q

<220>  
<221> variant  
<222> (77)..(77)  
<223> Xaa = Y or F

<220>  
<221> variant  
<222> (79)..(79)  
<223> Xaa = R or W

<220>  
<221> variant  
<222> (84)..(84)  
<223> Xaa = Y or L

43232-1.TXT

<220>  
<221> variant  
<222> (85)..(85)  
<223> Xaa = S or A

<220>  
<221> variant  
<222> (89)..(89)  
<223> Xaa = I or V

<220>  
<221> variant  
<222> (95)..(95)  
<223> Xaa = I or L

<220>  
<221> variant  
<222> (99)..(99)  
<223> Xaa = V or G

<220>  
<221> variant  
<222> (114)..(114)  
<223> Xaa = C or L

<220>  
<221> variant  
<222> (115)..(115)  
<223> Xaa = A or S

<220>  
<221> variant  
<222> (116)..(116)  
<223> Xaa = V or M

<220>  
<221> variant  
<222> (117)..(117)  
<223> Xaa = V or T

<220>  
<221> variant  
<222> (118)..(118)  
<223> Xaa = R or C

<220>  
<221> variant  
<222> (122)..(122)  
<223> Xaa = F or P

<220>  
<221> variant  
<222> (125)..(125)  
<223> Xaa = L or V

<220>  
<221> variant  
<222> (126)..(126)  
<223> Xaa = A or V

<220>  
<221> variant

## 43232-1.TXT

<222> (128)..(128)  
<223> Xaa = S or A

<220>  
<221> variant  
<222> (133)..(133)  
<223> Xaa = V or L or M

<220>  
<221> variant  
<222> (138)..(138)  
<223> Xaa = K or R

<220>  
<221> variant  
<222> (139)..(139)  
<223> Xaa = S or T

<220>  
<221> variant  
<222> (140)..(140)  
<223> Xaa = V or G

<220>  
<221> variant  
<222> (143)..(143)  
<223> Xaa = L or S or R

<220>  
<221> variant  
<222> (145)..(145)  
<223> Xaa = S or F

<220>  
<221> variant  
<222> (147)..(147)  
<223> Xaa = F or Y

<220>  
<221> variant  
<222> (148)..(148)  
<223> Xaa = T or A

<220>  
<221> variant  
<222> (149)..(149)  
<223> Xaa = V or I

<220>  
<221> variant  
<222> (150)..(150)  
<223> Xaa = V or I

<220>  
<221> variant  
<222> (151)..(151)  
<223> Xaa = T or C

<220>  
<221> variant  
<222> (152)..(152)  
<223> Xaa = N or S



## 43232-1.TXT

<220>  
 <221> variant  
 <222> (153)..(153)  
 <223> Xaa = F or V

<220>  
 <221> variant  
 <222> (156)..(156)  
 <223> Xaa = S or D

<220>  
 <221> variant  
 <222> (157)..(157)  
 <223> Xaa = L or V

<220>  
 <221> variant  
 <222> (164)..(164)  
 <223> Xaa = N or Q

<220>  
 <221> variant  
 <222> (179)..(179)  
 <223> Xaa = V or I

```

<400> 2
Ser Asx Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
1      5      10      15
Xaa Pro Leu His Pro Ala Ala Met Pro His Leu Leu Xaa Gly Ser Ser
20      25      30
Gly Leu Xaa Arg Tyr Val Ala Arg Leu Ser Ser Xaa Ser Xaa Xaa Xaa
35      40      45
Asn Xaa Gln Xaa Xaa Xaa Xaa Xaa Leu His Xaa Xaa Cys Ser Arg
50      55      60
Xaa Leu Tyr Val Ser Leu Xaa Leu Leu Tyr Xaa Thr Xaa Gly Xaa Lys
65      70      75      80
Leu His Leu Xaa Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro
85      90      95
Met Gly Xaa Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
100     105     110
Ile Xaa Xaa Xaa Xaa Xaa Arg Ala Phe Xaa His Cys Xaa Xaa Phe Xaa
115     120     125
Tyr Met Asp Asp Xaa Val Leu Gly Ala Xaa Xaa Xaa Glx His Xaa Glu
130     135     140
Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Leu Xaa Xaa Gly Ile His
145     150     155     160
Leu Asn Pro Xaa Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met
165     170     175
Gly Tyr Xaa Ile Gly
180

```

<210> 3  
 <211> 261  
 <212> DNA  
 <213> Artificial sequence

<220>  
 <223> synthetic

<400> 3  
 acmaaacctw yggayggaaa ytgacacgtg attcccatcc catcrtcytg ggctttcgsa 60  
 aratwcctat gggagkgggc ctcagycggt ttctcytggc tcagtttact agtgccattt 120

## 43232-1.TXT

gttcagtggg tctgyagggct tccccccact gtytggcttt cagytatatg gatgatgtgg 180  
twttgggggc caagtctgta carcatcktg agtccctttw trcckctrft accaattttc 240  
ttytgctcty ggggatacat t 261

<210> 4  
<211> 184  
<212> PRT  
<213> Artificial sequence

<220>  
<223> consensus

<220>  
<221> variant  
<222> (18)..(18)  
<223> Xaa = I or P

<220>  
<221> variant  
<222> (37)..(37)  
<223> Xaa = S or D

<220>  
<221> variant  
<222> (46)..(46)  
<223> Xaa = T or N

<220>  
<221> variant  
<222> (48)..(48)  
<223> xaa = R or N

<220>  
<221> variant  
<222> (51)..(51)  
<223> xaa = any amino acid

<220>  
<221> variant  
<222> (53)..(53)  
<223> xaa = N or Y or H

<220>  
<221> variant  
<222> (55)..(55)  
<223> xaa = H or Y

<220>  
<221> variant  
<222> (56)..(56)  
<223> Xaa = G or R

<220>  
<221> variant  
<222> (57)..(59)  
<223> Xaa = any amino acid

<220>  
<221> variant  
<222> (60)..(60)  
<223> Xaa = D or N

<220>

43232-1.TXT

<221> variant  
<222> (63)..(63)  
<223> Xaa = D or N

<220>  
<221> variant  
<222> (64)..(64)  
<223> Xaa = S or Y

<220>  
<221> variant  
<222> (68)..(68)  
<223> Xaa = N or Q

<220>  
<221> variant  
<222> (74)..(74)  
<223> Xaa = L or M

<220>  
<221> variant  
<222> (78)..(78)  
<223> Xaa = K or Q

<220>  
<221> variant  
<222> (80)..(80)  
<223> Xaa = Y or F

<220>  
<221> variant  
<222> (82)..(82)  
<223> Xaa = R or W

<220>  
<221> variant  
<222> (87)..(87)  
<223> Xaa = Y or L

<220>  
<221> variant  
<222> (88)..(88)  
<223> Xaa = S or A

<220>  
<221> variant  
<222> (92)..(92)  
<223> Xaa = I or V

<220>  
<221> variant  
<222> (98)..(98)  
<223> Xaa = I or L

<220>  
<221> variant  
<222> (102)..(102)  
<223> Xaa = V or G

<220>  
<221> variant  
<222> (117)..(117)  
<223> Xaa = C or L

Page 15

## 43232-1.TXT

<220>  
<221> variant  
<222> (118)..(118)  
<223> Xaa = A or S

<220>  
<221> variant  
<222> (119)..(119)  
<223> Xaa = V or M

<220>  
<221> variant  
<222> (120)..(120)  
<223> Xaa = V or T

<220>  
<221> variant  
<222> (121)..(121)  
<223> Xaa = R or C

<220>  
<221> variant  
<222> (125)..(125)  
<223> Xaa = F or P

<220>  
<221> variant  
<222> (128)..(128)  
<223> Xaa = L or V

<220>  
<221> variant  
<222> (129)..(129)  
<223> Xaa = A or V

<220>  
<221> variant  
<222> (131)..(131)  
<223> Xaa = S or A

<220>  
<221> variant  
<222> (136)..(136)  
<223> Xaa = V or L or M

<220>  
<221> variant  
<222> (141)..(141)  
<223> Xaa = K or R

<220>  
<221> variant  
<222> (142)..(142)  
<223> Xaa = S or T

<220>  
<221> variant  
<222> (143)..(143)  
<223> Xaa = V or G

<220>  
<221> variant

## 43232-1.TXT

<222> (144)..(144)  
<223> Xaa = Q or E

<220>  
<221> variant  
<222> (146)..(146)  
<223> Xaa = L or S or R

<220>  
<221> variant  
<222> (148)..(148)  
<223> Xaa = S or F

<220>  
<221> variant  
<222> (150)..(150)  
<223> Xaa = F or Y

<220>  
<221> variant  
<222> (151)..(151)  
<223> Xaa = T or A

<220>  
<221> variant  
<222> (152)..(152)  
<223> Xaa = S or A

<220>  
<221> variant  
<222> (153)..(153)  
<223> Xaa = V or I

<220>  
<221> variant  
<222> (154)..(154)  
<223> Xaa = T or C

<220>  
<221> variant  
<222> (155)..(155)  
<223> Xaa = N or S

<220>  
<221> variant  
<222> (156)..(156)  
<223> Xaa = F or V

<220>  
<221> variant  
<222> (159)..(159)  
<223> Xaa = S or D

<220>  
<221> variant  
<222> (160)..(160)  
<223> Xaa = L or V

<220>  
<221> variant  
<222> (167)..(167)  
<223> Xaa = N or Q

## 43232-1.TXT

<220>  
 <221> variant  
 <222> (182)..(182)  
 <223> Xaa = V or I

<400> 4  
 Ser Asn Asp Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr  
 1 5 10 15  
 His Xaa Pro Leu His Pro Ala Ala Met Pro His Leu Leu Ile Val Gly  
 20 25 30  
 Ser Ser Gly Leu Xaa Arg Tyr Val Ala Arg Leu Ser Ser Xaa Ser Xaa  
 35 40 45  
 Asn Ile Xaa Asn Xaa Gln Xaa Xaa Xaa Xaa Xaa Leu His Xaa Xaa  
 50 55 60  
 Cys Ser Arg Xaa Leu Tyr Val Ser Leu Xaa Leu Leu Tyr Xaa Thr Xaa  
 65 70 75 80  
 Gly Xaa Lys Leu His Leu Xaa Xaa His Pro Ile Xaa Leu Gly Phe Arg  
 85 90 95  
 Lys Xaa Pro Met Gly Xaa Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe  
 100 105 110  
 Thr Ser Ala Ile Xaa Xaa Xaa Xaa Xaa Arg Ala Phe Xaa His Cys Xaa  
 115 120 125  
 Xaa Phe Xaa Tyr Met Asp Asp Xaa Val Leu Gly Ala Xaa Xaa Xaa Xaa  
 130 135 140  
 His Xaa Glu Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Leu Xaa Xaa  
 145 150 155 160  
 Gly Ile His Leu Asn Pro Xaa Lys Thr Lys Arg Trp Gly Tyr Ser Leu  
 165 170 175  
 Asn Phe Met Gly Tyr Xaa Ile Gly  
 180

<210> 5  
 <211> 426  
 <212> DNA  
 <213> Orthohepadnavirus hepatitis B

<400> 5  
 atcctgctgc tatgcctcat cttcttggtg gttcttctgg actaccaagg tatgttgtct 60  
 gttgttcctc tacitccaag aacatcaact accagcacgg gaccatgcaa gacctgcacg 120  
 attcctgctc aaggaacctc tatgtttccc tcttcttgct gtacaaaacc ttcggacgga 180  
 aactgcactt gtattcccat cccatcatct tgggctttcg caagattcct atgggagtg 240  
 gcctcagtcg gtttctctg gctcagttta ctagtccat ttgttcagtg gttcgtagg 300  
 ctttcccca ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
 tacaacatct tgagtcctct tttacctcta ttaccaattt tcttttgtct ttgggtatac 420  
 atttga 426

<210> 6  
 <211> 425  
 <212> DNA  
 <213> Orthohepadnavirus hepatitis B

<400> 6  
 atcctgctgc tatgcctcat cttcttggtg gttcttctgg actatcaagg tatgttgccc 60  
 gttgttcctc taattccagg atcatcaacc accagcacag gaccatgcaa aacctgcacg 120  
 actcctgctc aaggaacctc tatgtttccc tcatgttgct gtacaaaacc tacggacgga 180  
 aactgcacct gtattcccat cccatcatct tgggctttcg caaaatacct atgggagtg 240  
 gcctcagtcg gtttctctg gctcagttta ctagtccat ttgttcagtg gttcgtagg 300  
 ctttcccca ctgtctggct ttcagttata tggatgatgt ggttttgggg gccaaagtctg 360  
 tacaacatct tgagtcctct tatgccgctg ttaccaattt tcttttgtct ttgggtatac 420  
 attta 425

<210> 7

## 43232-1.TXT

<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 7  
atcctgctgc tatgcctcat cttcttggtg gttcttctgg actaccaagg tatgttgccc 60  
gtttgtcctc tacitccagg aacatcaact accagcacgg gaccatgcaa gacctgcacg 120  
attcctgctc aaggaacctc tatgtttccc tcttggtggt gtacaaaacc ttcggacgga 180  
aactgcactt gtattcccat cccatcatcc tgggctttcg caagattcct atgggagtgg 240  
gcctcagtcg gtttctcctg gctcagttta ctagtgccat ttgttcagtg gttcgcaggg 300  
ctttccccca ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacaacatct tgagtcctct tttacctcta ttaccaattt tcttttgtct ttgggtatac 420  
atttga 426

<210> 8  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 8  
atcctgctgc tatgcctcat cttcttggtg gttcttctgg actatcaagg tatgttgccc 60  
gtttgtcctc taattccagg atcttcaact accagcacgg gaccatgcag aacctgcacg 120  
actcctgctc aaggaacctc tatgtatccc tcctgttggt gtaccaaacc ttcggacgga 180  
aattgcacct gtattcccat cccatcatcc tgggctttcg gaaaattcct atgggagtgg 240  
gcctcagccc gtttctcctg gctcagttta ctagtgccat ttgttcagtg gttcgtaggg 300  
ctttccccca ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacagcatct tgagtcctct tttaccgctg ttaccaattt tcttctgtct ttgggtatac 420  
atttaa 426

<210> 9  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 9  
atcctgctgc tatgcctcat cttcttggtg gttcttctgg actatcaagg tatgttgccc 60  
gtttgtcctc taattccagg atcttcaaca accagcacgg gaccatgcag aacctgcacg 120  
actcctgctc aaggaacctc tatgtatccc tcctgttggt gtaccaaacc ttcggacgga 180  
aattgcacct gtattcccat cccatcatct tgggctttcg gaaaattcct atgggagtgg 240  
gcctcagccc gtttctcctg gctcagttta ctagtgccat ttgttcagtg gttcgtaggg 300  
ctttccccca ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacagcatct tgagtcctct tttaccgctg ttaccaattt tcttttgtct ctgggtatac 420  
atttaa 426

<210> 10  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 10  
atcctgctgc tatgcctcat cttcttggtg gttcttctgg actatcaagg tatgttgccc 60  
gtttgtcctc taattccagg atcctcaacc accagcacgg gaccatgccg aacctgcacg 120  
actcctgctc aaggaacctc tatgtatccc tcctgttggt gtaccaaacc ttcggacgga 180  
aattgcacct gtattcccat cccatcatcc tgggctttcg gaaaattcct atgggagtgg 240  
gcctcagccc gtttctcctg gctcagttta ctagtgccat ttgttcagtg gttcgtaggg 300  
ctttccccca ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacagcatct tgagtcctct tttaccgctg ttaccaattt tcttttgtct ttgggtatac 420  
atttaa 426

<210> 11  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

## 43232-1.TXT

<400> 11  
atcctgctgc tatgcctcat cttcttattg gttcttctgg attatcaagg tatgttgccc 60  
gtttgtcctc taattccagg atcaacaaca accagtcagg gaccatgcaa aacctgcacg 120  
actcctgctc aagggaacct tatgtttccc tcatgttgct gtacaaaacc tacggatgga 180  
aattgcacct gtattcccat cccatcgtcc tgggctttcg caaaatacct atgggagtg 240  
gcctcagtcg gtttctcttg gctcagttta ctagtgccat ttgttcagtg gttcgtagg 300  
ctttccccc ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacagcatcg tgagtcctct taccacgctg ttaccaattt tcttttgtct ctgggtatac 420  
atttaa

<210> 12  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 12  
atcctgctgc tatgcctcat cttcttattg gttcttctgg actaccaagg tatgttgccc 60  
gtttgtcctc tacttccagg aacatcaacc accagtcagg gaccatgcaa gacctgcacg 120  
attcctgctc aagggaacct tatgtttccc tcttgttgct gtacaaaacc ttcggacgga 180  
aactgcacct gtattcccat cccatcatcc tgggctttcg caagattcct atgggagggg 240  
gcctcagtcg gtttctcttg gctcagttta ctagtgccat ttgttcagtg gttcgtagg 300  
ctttccccc ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacaacatct tgagtcctct tttacctcta ttaccaattt tcttttgtct ttgggtatac 420  
atttga

<210> 13  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 13  
atcctgctgc tatgcctcat cttcttattg gttcttctgg actaccaagg tatgttgccc 60  
gtttgtcctc tacttccagg aacatcaacc accagtcagg gaccatgcaa gacctgcacg 120  
attcctgctc aagggaacct tatgtttccc tcttgttgct gtacaaaacc ttcggacgga 180  
aactgcacct gtattcccat cccatcatcc tgggctttcg caagattcct atgggagggg 240  
gcctcagtcg gtttctcttg gctcagttta ctagtgccat ttgttcagtg gttcgtagg 300  
ctttccccc ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacaacatct tgagtcctct tttacctcta ttaccaattt tcttttgtct ttgggtatac 420  
atttaa

<210> 14  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 14  
atcctgctgc tatgcctcat cttcttattg gttcttctgg actatcaagg tatgttgccc 60  
gtttgtcctc taattccagg atcctcaaca accagtcagg gaccatgccc gacctgcacg 120  
actactgctc aagggaacct tatgtatccc tcttgttgct gtacaaaacc ttcggacgga 180  
aattgcacct gtattcccat cccatcatcc tgggctttcg gaaaattcct atgggagtg 240  
gcctcagccc gtttctcttg gctcagttta ctagtgccat ttgttcagtg gttcgtagg 300  
ctttccccc ctgtttggct ttcagttata tggatgatgt ggtattgggg gccaaagtctg 360  
tacagcatct tgagtcctct tttaccgctg ttaccaattt tcttttgtct ttgggtatac 420  
atttaa

<210> 15  
<211> 426  
<212> DNA  
<213> Orthohepadnavirus hepatitis B

<400> 15  
atcctgctgc tatgcctcat cttcttattg gttcttctgg actatcaagg tatgttgccc 60



## 43232-1.TXT

```

gtttgtcctc taattccagg atcttcaacc accagcacgg gaccatgcag gacctgcacg 120
actcctgctc aaggcaactc tatgtatccc tcctgttgct gtaccaaacc ttcggacgga 180
aattgcacct gtattcccat cccatcatct tgggctttcg gaaaattcct atgggagtgg 240
gcctcagccc gtttctcctg gctcagttta ctagtccat ttgttcagt9 gttcgtaggg 300
ctttcccca ctgtttggct ttcagttata tggatgatgt ggtattggg9 gccaaagtctg 360
tacagcatct tgagtccctt tttaccgctg ttaccaattt tcttttgtct ttgggcatac 420
atttaa

```

&lt;210&gt; 16

&lt;211&gt; 426

&lt;212&gt; DNA

&lt;213&gt; Orthohepadnavirus hepatitis B

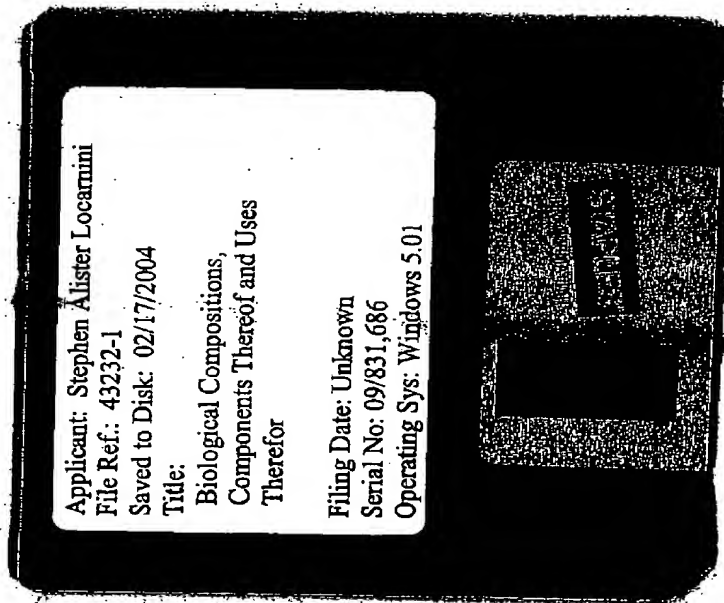
&lt;400&gt; 16

```

atcctgctgc tatgcctcat cttcttggtg gttcttctgg actatcaagg tatgttgccc 60
gtttgtcctc taattccagg atcatcaacc accagcacgg gaccatgcaa gacctgcaca 120
actcctgctc aaggaaacct tatgtttccc tcatgttgct gtacaaaacc tatggatgga 180
aactgcacct gtattcccat cccatcatct tgggctttcg caaaatacct atgggagtgg 240
gcctcagtcg gtttctcttg gctcagttta ctagtccat ttgttcagt9 gttcgtaggg 300
ctttcccca ctgtctggct ttcagttata tggatgatgt ggtattggg9 gccaaagtctg 360
tacaacatct tgagtccctt tatgccgctg ttaccaattt tcttttgtct ttgggtatac 420
atttaa

```

COPY



**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☒ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**